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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/714,410	11/14/2003	Stephan Oberle	Westphal.7377	2025

7590

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EXAMINER

KRAUSE, JUSTIN MITCHELL

ART UNIT

PAPER NUMBER

3682

DATE MAILED: 08/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/714,410

Applicant(s)

OBERLE ET AL.

Examiner

Justin Krause

Art Unit

3682

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 June 2006.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4, 6 and 8-17 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-4, 6, 8-17 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 08 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-4, 6 and 8-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 1 (and subsequently 2-4, 6 and 8-14) recites the broad recitation "an actuator in an

automotive vehicle", and the claim also recites "power assisted steering" which is the narrower statement of the range/limitation.

4. Claim 17 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 17 is generally narrative, mixing positively recited structure with functional language such that is not clear what exactly should be given patentable weight. The examiner suggests re-writing the claim in accordance with 37 CFR 1.75(i).

#### ***Claim Objections***

5. Claim 2 is objected to because of the following informalities: amended claim 2 omits the word "at" from the phrase "at least approximately equal curvature...." Causing the phrase to read "the convex region is piecewise convex with least approximately equal curvature" which is grammatically awkward. Appropriate correction is required.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

#### ***Claim Rejections - 35 USC § 102***

6. Claim 1-4,6, 8, 10 and 12-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Shimizu et al (US Patent 6,543,569).

Shimizu discloses a power assisted steering system having a gear mechanism (32) coupled to a steering column (12) with a gear (33) and a mating gear (34), each having teeth via which they engage each other, wherein the effective profiles of the tooth faces of the gear and mating gear are made such that a linear contact over the height of the teeth comes about when the teeth engage. (Fig 1)

Regarding claims 2-4, 12 and 14, the tooth profile is a circular arc (non-involute) and each tooth has a convex and concave region, the concave region is disposed in a region adjoining a tooth base and the convex region is disposed in a region adjoining a tooth tip. (Col 12, line 62-Col 13, line 57 and Figures 8a-8d).

Regarding claim 6, the gear mechanism comprises a worm gear mechanism that includes a worm gear (113) and a worm (112).

Regarding claim 8, 13 and 16, the worm is made from metal and the worm gear is made using resin or plastic, which is lower strength than the metal worm. (Col 11, lines 28-31)

Regarding claim 10, the worm wheel is cylindrical (Fig 6).

***Claim Rejections - 35 USC § 103***

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of Pickles (US Patent 2,760,381).

Shimizu discloses all of the claimed subject matter as described above.

Shimizu does not disclose the tooth thickness of the teeth of the worm gear is greater than that of the teeth of the worm.

Pickles teaches a worm and worm wheel arrangement where the worm gear is a weaker material than the worm and the thickness of each tooth on the worm wheel being greater than one half the circular pitch and the thread of the worm being less than one half the circular pitch, the increased tooth thickness increases the strength of the weaker gear wheel while not increasing the amount of unnecessary material on the worm. (Col 1, lines 60-65).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the larger tooth thickness on the worm gear made of weaker material as taught by Pickles into the device of Shimizu, the motivation would have been the increase in strength of the weaker worm gear while not adding unnecessary material to the worm.

8. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu and Pickles in view of Scott (US Patent 2,279,414).

Shimizu discloses all of the claimed subject matter as described above.

Shimizu does not disclose the worm made globoidal in shape.

Scott teaches a globoidal worm engaging a worm wheel, the globoidal shape making it possible to increase the possible bearing between the thread flanks of the worm and tooth flanks of the worm wheel when carrying a heavy load. (pg 1, lines 5-11)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Shimizu and incorporate a globoidal

shaped worm as taught by Scott, the motivation would have been to increase the possible bearing between the thread flanks of the worm and tooth flanks of the worm wheel and increase the load carrying ability.

### ***Response to Arguments***

9. Applicant's arguments filed June 8, 2006 have been fully considered but they are not persuasive.

Applicant argues that the Shimizu reference fails to disclose or suggest tooth faces of a gear and mating gear that each include a concave and convex region.

The examiner disagrees, finding that Shimizu explicitly states the tooth profile has a concave and a convex region (see Col 12, line 62-Col 13, line 57 and Figures 8a-8d).and that meshing contact occurs between the concave and convex surfaces of the opposing gear teeth (col 13, lines 40-48).

### ***Drawings***

10. The proposed drawing changes filed June 8, 2006 are accepted. New formal drawings will need to be submitted upon issue of the application.

### ***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

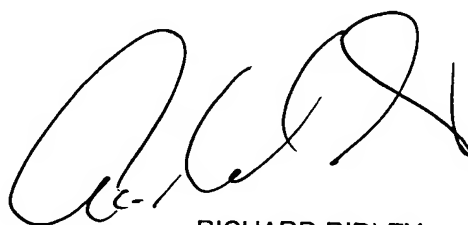
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin Krause whose telephone number is 571-272-3012. The examiner can normally be reached on Monday - Friday, 7:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on 571-272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMK  
8/11/06

A handwritten signature in black ink, appearing to be 'R. Ridley', written in a cursive style.

RICHARD RIDLEY  
SUPERVISORY PATENT EXAMINER